

Section 3. DIRECTION FINDER (DF) SERVICE

5-3-1. ACTIONS REQUIRED

When providing DF services to an aircraft in emergency status:

- a. Determine if the aircraft is in VFR or IFR weather conditions, fuel remaining, altitude, and heading.
- b. If the aircraft is operating in IFR weather conditions, coordinate with the appropriate control facility.
- c. Determine if the aircraft is on a flight plan. If the aircraft is not on an IFR flight plan and is in VFR weather conditions, advise the pilot to remain VFR.
- d. Alert the DF net whenever the following conditions exist:
 1. The pilot is lost.
 2. An emergency is declared.

NOTE-

It is not necessary to alert the DF net if a terminal controller visually sights the aircraft.

5-3-2. VFR DF SERVICE

- a. Provide DF service to VFR aircraft when either of the following conditions exist:
 1. The pilot requests the service.
 2. You suggest the service and the pilot concurs.

- b. Advise the pilot to remain VFR, and provide local altimeter setting.

PHRASEOLOGY-

MAINTAIN V-F-R AT ALL TIMES. ADVISE IF HEADING OR ALTITUDE CHANGE IS NECESSARY TO REMAIN V-F-R. (location) ALTIMETER (setting).

- c. Obtain heading and altitude. Advise the pilot to maintain straight and level flight and to align the heading indicator with the magnetic compass.

PHRASEOLOGY-

MAINTAIN STRAIGHT AND LEVEL FLIGHT. RESET YOUR HEADING INDICATOR TO AGREE WITH YOUR MAGNETIC COMPASS. AFTER YOU HAVE DONE THIS, SAY YOUR HEADING AND ALTITUDE.

- d. Determine the weather and fuel conditions.

PHRASEOLOGY-

WHAT IS THE WEATHER AT YOUR ALTITUDE AND FUEL REMAINING IN TIME?

- e. Advise the pilot to maintain the same heading, request type of navigational equipment, and airspeed.

PHRASEOLOGY-

CONTINUE HEADING (degrees). WHAT TYPE OF NAVIGATIONAL EQUIPMENT DO YOU HAVE ON BOARD AND WHAT IS YOUR AIRSPEED?

- f. While receiving the reply, determine the bearing. After determining the aircraft's bearing, provide DF service by informing the pilot of the following:
 1. Direction of turn.
 2. Magnetic heading, spoken in three digits (do not state the word "degrees"). All headings will be provided in increments of 5 degrees.
 3. Nature of service.
 4. Microphone instructions.
 5. Request for report when airport is in sight.

PHRASEOLOGY-

TURN LEFT/RIGHT HEADING (degrees) FOR D-F GUIDANCE TO (name of airport, fix, or location). WHEN A REQUEST FOR TRANSMISSION IS RECEIVED, PRESS YOUR MICROPHONE BUTTON FOR THE SPECIFIED NUMBER OF SECONDS FOLLOWED BY YOUR AIRCRAFT IDENTIFICATION.

and if appropriate,

REPORT (name) AIRPORT IN SIGHT.

- g. Provide pertinent information on known field conditions and latest weather information at the destination airport.

- h. Request the pilot to transmit for specified periods (normally 5-10 seconds), as required. The frequency of these requests will vary depending on such factors as wind, frequency congestion, and distance, but should be made at least once each minute until the pilot reports the airport in sight or the service is terminated.

PHRASEOLOGY-

TRANSMIT (number) SECONDS.

TURN LEFT/RIGHT, HEADING (degrees), or CONTINUE HEADING (degrees).

- i. Inform the pilot when DF service is terminated and provide the (CTAF) frequency, if appropriate, and the local altimeter setting.

PHRASEOLOGY-

D-F ORIENTATION SERVICE TERMINATED. COMMON TRAFFIC ADVISORY FREQUENCY (frequency) ALTIMETER (setting).

NOTE-

Service may be terminated when airport is in sight, the desired fix or location is reached, practice steers or approaches are discontinued, etc.

- j. Notify DF net when service is terminated.

5-3-3. DF FIXING BY NET

When the DF net is in operation, determine the aircraft's position as follows:

- a. Tell the pilot to transmit for 10 seconds.
- b. Plot the bearings obtained from two or more antenna sites. Inform the pilot of the aircraft's position, and the safe altitude for orientation in that area.

NOTE-

The ARTCC or AFSS/FSS designated as DF net control is responsible for evaluating and plotting bearings received from individual antenna sites.

5-3-4. DF FIXING BY ONE FACILITY

One DF facility can determine an aircraft's location by:

- a. Plotting the position from a VOR or ADF and an observed DF bearing.
- b. Time method.

1. Determine the aircraft's heading and DF bearing.

2. Tell the pilot to turn left or right, whichever requires the lesser amount of turn, to a heading perpendicular to the DF bearing.

3. After turn is completed, tell the pilot to transmit (normally 5-10 seconds). Observe the DF bearing.

4. One minute later, request another transmission. Determine bearing and turn aircraft toward the DF site.

5. Divide the difference in bearings (steps 3 and 4) into 60. The result is the number of minutes the aircraft is from the DF site.

NOTE-

One station DF fixing is based on zero winds.

EXAMPLE-

Original bearing of 360 and aircraft heading of 200, the pilot should be advised to turn right to a heading of 270. Observe bearing, wait 1 minute, and observe bearing. If the first bearing (after completion of turn) was 337 and the second bearing was 325, a difference of 12, the aircraft is 5 minutes from the DF site.

- c. Distance method.

1. Use the procedures specified in steps 1 through 4 in subpara 5-3-4b.

2. Request the aircraft's true airspeed.

3. Compute the distance by dividing the bearing change (for 1 minute) into the airspeed figure.

EXAMPLE-

140 airspeed divided by 10 (bearing change for 1 minute) = 14 miles from DF site.

d. After the aircraft's position is determined, provide this information, and the safe altitude for orientation in that area.

5-3-5. EMERGENCY DF APPROACH PROCEDURE

a. Under emergency conditions where a standard instrument approach cannot be executed, provide DF guidance and instrument approach service, if available, as follows:

1. Obtain and relay ATC clearance including radio failure procedures.

2. Issue destination airport weather.

3. Provide guidance as specified in VFR DF Service, para 5-3-2, except delete the VFR requirement. To avoid large turns over the DF site, the aircraft should be guided to pass over the DF site established on the course that the pilot will maintain on the outbound leg of the approach.

PHRASEOLOGY-

TURN LEFT/RIGHT, HEADING (degrees) FOR D-F GUIDANCE AND APPROACH TO THE (name) AIRPORT. MAINTAIN (altitude specified by ATC). WHEN A REQUEST FOR TRANSMISSION IS RECEIVED, PRESS YOUR MICROPHONE BUTTON FOR THE SPECIFIED NUMBER OF SECONDS FOLLOWED BY YOUR AIRCRAFT IDENTIFICATION. REPORT AIRPORT IN SIGHT. IF NO TRANSMISSION IS RECEIVED FOR (time of interval) PROCEED V-F-R. IF UNABLE, PROCEED (routing, fix, altitude as specified by ATC). CONTACT (facility) ON (frequency).

b. Inform the pilot when the aircraft is over the DF site. Advise pilot to perform landing check, and provide guidance for outbound track.

PHRASEOLOGY-

OVER (ABEAM) D-F SITE, PERFORM LANDING CHECK. CONTINUE HEADING (degrees) or TURN LEFT/RIGHT, HEADING (degrees). REPORT ESTABLISHED HEADING (degrees).

c. Provide DF approach guidance in accordance with the triangle or teardrop approach procedures as specified on FAA Form 8260-10.

1. Triangle Approach Pattern.

(a) Time the outbound leg and issue descent information. Normally, the outbound track should be maintained for 3 minutes, but this may be adjusted depending on airspeed and nature of the emergency. Time intervals between bearing observations should not exceed 15 seconds.

PHRASEOLOGY-

ON OUTBOUND LEG. DESCEND AND MAINTAIN (altitude specified on FAA Form 8260-10 for outbound course).

(b) When outbound leg is completed, issue turn instructions so that the aircraft's course is perpendicular to the final approach course. Issue further descent information if so specified on FAA Form 8260-10. Issue missed approach procedures as specified on FAA Form 8260-10.

PHRASEOLOGY-

ON BASE LEG. IN CASE OF MISSED APPROACH, CLIMB TO (altitude) ON COURSE (degrees) WITHIN (number) MILES.

(c) At least two turns should be made onto final approach.

(d) When the aircraft is on final approach, advise the pilot to start descent and provide minimum descent altitude and field elevation information. Take

bearings more frequently. Time intervals between bearing observations should not exceed 5 seconds during the estimated last 30 seconds of the approach.

PHRASEOLOGY-

ON FINAL APPROACH, BEGIN DESCENT. MINIMUM DESCENT ALTITUDE (altitude), FIELD ELEVATION (elevation). REPORT RUNWAY IN SIGHT.

(e) If the aircraft misses the approach, inform the appropriate control facility.

2. Teardrop Approach Pattern.

(a) Provide guidance to establish the aircraft on the outbound course. Issue descent information, if appropriate. Time intervals between bearing observations should not exceed 15 seconds.

(b) Issue direction of turn and inbound heading information. Issue missed approach procedures as specified on FAA Form 8260-10.

(c) When procedure turn is complete, provide directional guidance and issue descent information. The time intervals between the bearing observations should not exceed 5 seconds during the estimated last 30 seconds of the approach.

(d) If aircraft misses the approach, inform the appropriate control facility.